REMARKS

Applicant acknowledges the Final Rejection of 31 AUG. 2006 and requests reconsideration of the claims, as amended.

Enclosed herewith are amended claims 1 to 10, which distinguish over the cited prior art. Claim 1, as amended, includes all features of former claims 1 and 2 and, thus, matches the German pending independent claim 1 in the ZF Sachs opposition currently underway in Europe. Dependent claims 3 through 9 are substantially unchanged. Second independent claim 10 has been amended to include the feature of former claim 2.

In the Final Rejection dated August 31, 2006, the Office has rejected claim 2 (now incorporated into parent claim 1) as being obvious over a combination of LÜTKENHAUS, BEST and LILL. However, Applicants respectfully disagrees with this contention. Set forth below are:

1. a detailed discussion of pending claim 2 in view of the specification,
2. a detailed discussion of LÜTKENHAUS,
3. a detailed discussion of BEST,
4. a detailed discussion of LILL, and
5. a conclusion with respect to the rejection of pending claim 2.

1. Subject matter former claim 2 in view of the specification:

According to claim 2, an inventive stator assembly includes a plurality of stator poles having at least a first, a second, a third, a fourth, a fifth and a sixth stator pole that are arranged successively within a predetermined angular range. The number of stator poles defining the plurality of stator poles is divisible by six. On the inventive stator assembly, three winding phases are connected in a delta configuration using three respective current rails that are associated with respective ones of said winding phases for their connection. The inventive delta connection that includes six winding coils is explained in the following with respect to Fig. 4 of the present application.

As can be seen from Fig. 4, the delta configuration is formed having, in each phase, two winding coils connected in parallel, namely coils 51 and 54 in

phase 70 between contacts U and V, coils 52 and 55 in phase 72 between contacts V and W, and coils 53 and 56 in phase 74 between contacts W and U. The winding coil 51 that is arranged on a first stator pole is electrically connected between a first current rail 38 and a second current rail 40. The winding coil 52 that is arranged on a second stator pole is electrically connected between the second current rail 40 and a third current rail 42. The winding coil 53 that is arranged on a third stator pole is electrically connected between the third current rail 42 and the first current rail 38. The winding coil 54 that is arranged on a fourth stator pole is electrically connected between the first current rail 38 and the second current rail 40. The winding coil 55 that is arranged on a fifth stator pole is electrically connected between the second current rail 40 and the third current rail 42. The winding coil 56 that is arranged on a sixth stator pole is electrically connected between the third current rail 42 and the first current rail 38.

Furthermore, in the inventive stator assembly at least two successive winding coils are continuously wound and electrically connected at their interface to an associated current rail without interrupting their winding wire. In other words, during winding the connection between adjacent winding coils need not be interrupted; rather, these coils can remain connected via wire contact terminals. It is very advantageous that this enables automatic manufacture of the stator winding, since the winding wire no longer need be interrupted during winding, but rather if necessary can be continuously wound from the first winding coil through to the last winding coil

2. Subject matter of LÜTKENHAUS:

LÜTKENHAUS was already described in detail in the response to the Office Action dated March 21, 2006. For brevity, this detailed description will not be repeated. However, please note the following with respect to LÜTKENHAUS.

LÜTKENHAUS describes a stator assembly of the mass-produced in-line type that is configured to allow simple and easy mass-production of corresponding electric machines (cp. LÜTKENHAUS, column 1, lines 48 to 55).

Accordingly, LÜTKENHAUS describes a machine that can be

> *"assembled mainly by pushing its parts together axially. The stator 3 can be fitted in the housing 28 and then the plate 8 installed with the connections made, or the coils 7 can be mounted on the plate 8 and then this entire subassembly can be pushed into the housing 28."*

(cp. LÜTKENHAUS, column 3, lines 36 to 41).

More specifically, LÜTKENHAUS describes a stator assembly having six windings forming a star connection. This stator assembly is described in the following with respect to Fig. 2 of LÜTKENHAUS, which is illustrated in marked-up form below.

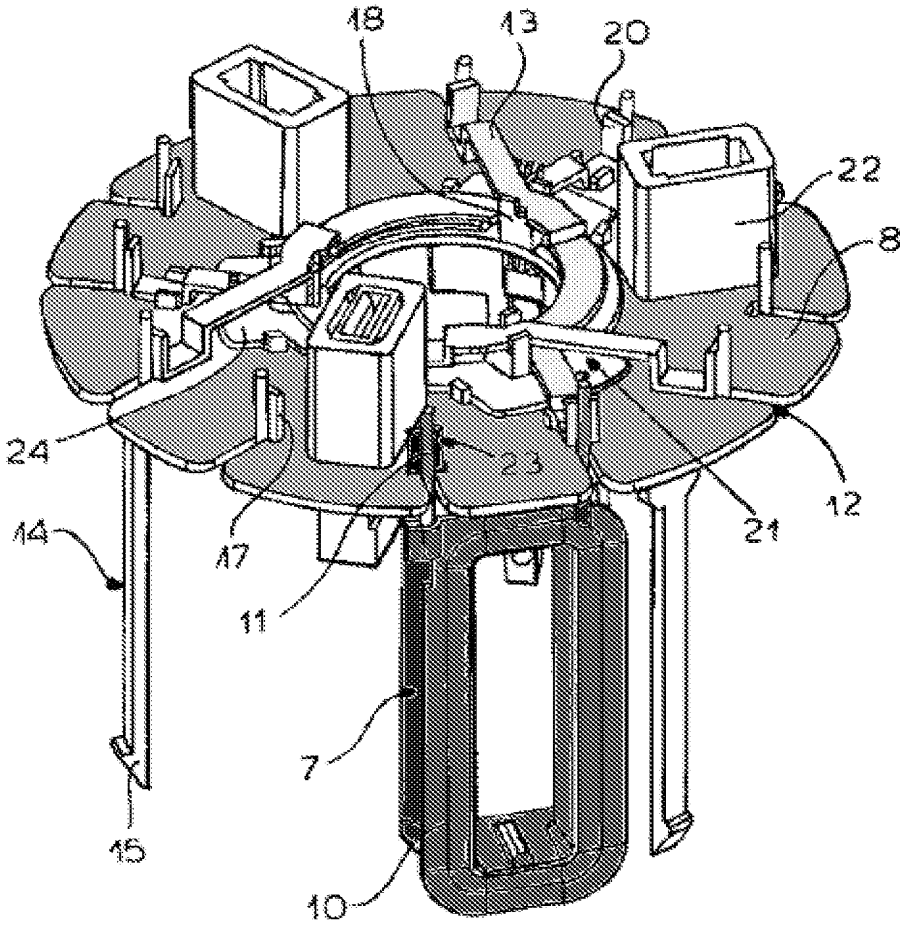

FIG.2

As can be seen from Fig. 2, each winding 7 (blue) is provided on a respective dielectric support frame 10 (red) that is carried by a disk 8 (green) having slots 12 in which fit ends 11 of the stiff wire forming the windings 7 (cp. LÜTKENHAUS, column 3, lines 5 to 10). As noted above, the six windings 7 (only one is shown in Fig. 4) are connected in a star connection configuration. To this end, one wire end 11 of each winding 7 is connected to a wire end 11 of a winding 7 "*...diametrally opposite it...*" (cp. LÜTKENHAUS, column 2, lines 29 to 34) using an essentially linear connector stripe 13 (yellow). Manufacture of the star configuration is described in detail in column 3, lines 15 to 27 of LÜTKENHAUS:

> *"One end of each winding 7 is connected in a star hookup to an end tab 20 of one of three shaped copper connector strips 13 on the plate 8 and through this strip 13 to one end of the winding 7 diametrically across from it. The connector strips 13 are secured by clips 18 to the outer face of the plate 8 and are bent to pass each other at 21 with axial spacing. Three of the remaining six ends 11 are connected together via tabs 17 of a circuit board or connector strip 16 on the inner face of the plate 8 and the other three ends 11 bear on connector tabs 23 of connector strips running on the inside face of the board 18 and connected in turn to three sockets 22. The tabs 17, 20, and 23 are soldered to and/or crimped on the respective winding terminals ends 11."*

From the above it is clear that according to LÜTKENHAUS the windings 7 are pre-wound onto the support frames 10 such that the frames 10 can simply and easily be mounted on the disk 8.

3. Subject matter of BEST:

BEST describes an interconnection of nine stator windings in a delta connection configuration using three annular connecting leads. The annular connecting leads are embedded in an insulating part having individual insulating parts, each being provided for a single annular connecting lead.

The delta connection of the nine stator windings is schematically illustrated in Figs. 5 and 6 of BEST. The interconnection arrangement for building the delta connection configuration of BEST using the annular connecting leads is described in the following with respect to FIG. 7 of BEST, a marked up version of which is illustrated below.

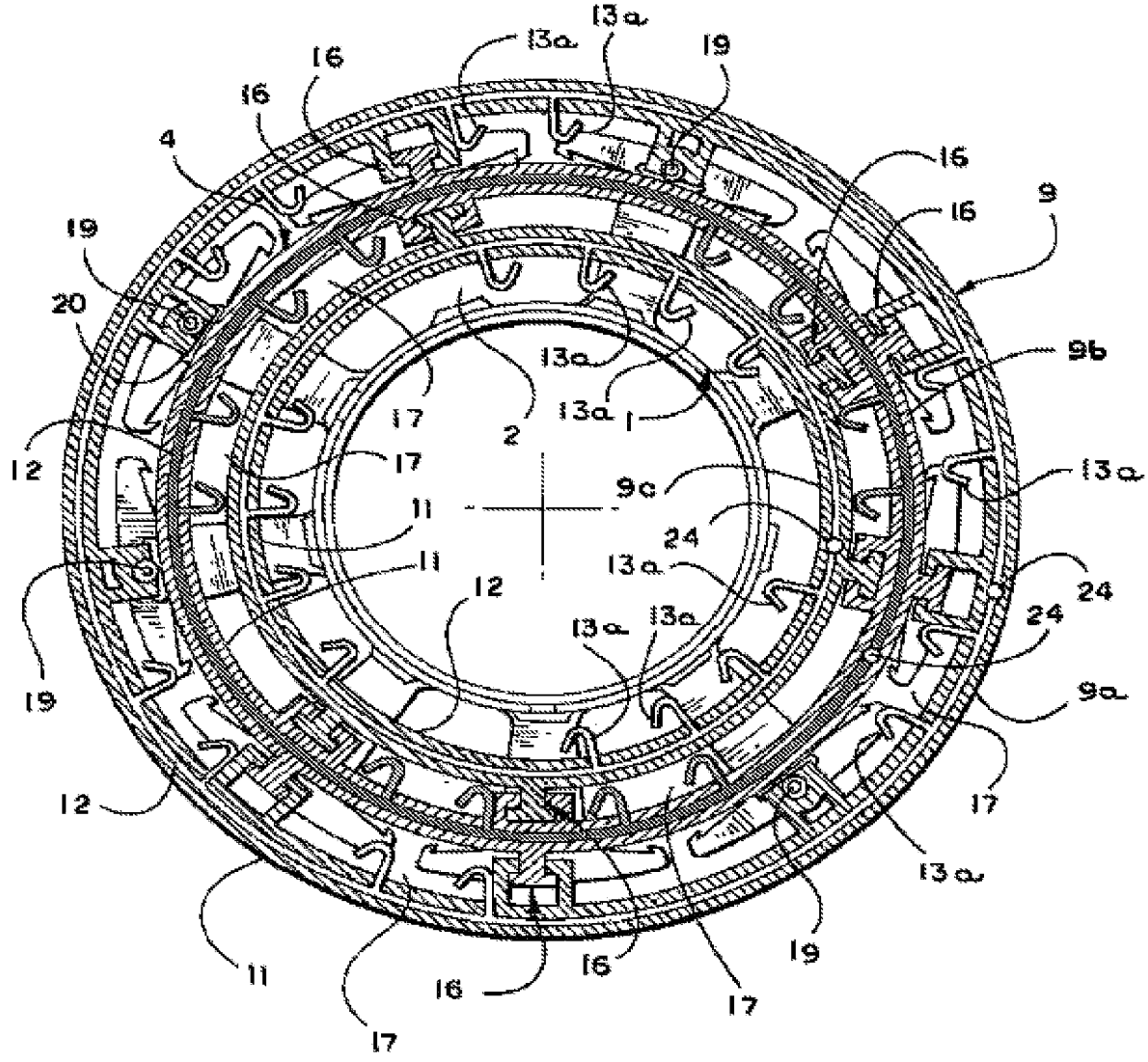
13a
13a
19
16
16
4
16
9
19
20
13a
9b
17
2
13a
1
12
17
9c
13a
11
24
13a
11
12
24
24
13a
13a
19
9a
12
17
13a
11
16
16
19
17
17

Fig. 7

As can be seen from Fig. 7, three annular connecting leads 12 (cp. BEST, column 3, lines 57 to 59 – only the middle annular connecting lead is marked-up in red, for clarity) are provided for interconnecting the stator windings in delta configuration. Each annular connecting lead 12 has a plurality of end hooks 13a (only the end hooks of the middle annular connecting lead are marked-up in green, for clarity). The wire ends 7 of the windings can be pressed or pressure welded to the hooks 13a in order to establish an electrically conductive connection between the windings and the annular connecting leads (cp. BEST, column 4, lines 23 to 27).

However, when looking at Fig. 7 of BEST, one can imagine that connecting the wire ends to the appropriate hooks is a difficult and time-consuming task, as one needs to figure out which wire end is coming from which winding and needs to be connected to which hook.

4. Subject matter of LILL:

LILL describes a stator for a stepper motor having a stator core with a plurality of coil supports on which coils are wound. The coils are connected in a star connection form having certain of the coil wire ends that are commonly connected (cp. LILL, column 7, lines 23 to 30). All coils are wound without interrupting the coil wire.

More specifically, the stator is produced by a continuous winding process followed by a terminal insertion step in which respective terminals are inserted into associated terminal housings. The winding of the coils and the formation of the electrical connections between the lead wires and the coil windings is illustrated in Figs. 8 to 12 of LILL. The winding operation is described in column 5, line 19 to column 6, line 21 of LILL and can be carried out by known types of coil winders such as machines available from Windamatic Systems Incorporated, of Fort Wayne, Ind., and from Essex Machine and Terminal Division of Essex International, also of Fort Wayne, Ind.

5. The rejection of pending claim 2 as being obvious over a combination of LÜTKENHAUS, BEST and LILL:

The Office has rejected pending claim 2 as obvious over a combination of LÜTKENHAUS, BEST and LILL. Specifically, the Office contends that it would have been obvious to a person having ordinary skill in the art to combine the teachings of LÜTKENHAUS and BEST in order to connect the winding coils in delta connection in order to achieve a stator assembly with fully automatic interconnecting, and to wind the winding coils of the stator assembly continuously without interrupting the winding wire, as described by LILL.

Applicants cannot agree with this opinion.

In the Office Action dated August 31, 2006, the Examiner fails to establish a *prima facie* case of obviousness, as required according to MPEP § 2142. More specifically, the Examiner does not meet the basic criterion that there must be some suggestion or motivation, either in LÜTKENHAUS, BEST and/or LILL or in the general knowledge of a person skilled in the art, to modify LÜTKENHAUS or to combine the teachings of LÜTKENHAUS, BEST and LILL with respect to pending claim 2. Furthermore, such a combination must teach all claim limitations recited in pending claim 2. However, as described in more detail below LÜTKENHAUS, BEST and LILL lack motivation for combination and do not teach all claim limitations with respect to pending claim 2, as required according to MPEP § 2143.

As was noted above, LÜTKENHAUS describes a stator assembly having <u>six</u> windings that are interconnected in a star connection configuration using essentially <u>linear</u> connector stripes (cp. Fig. 2 of LÜTKENHAUS) and connectors on a support plate or disk (cp. LÜTKENHAUS, column 3, lines 22 to 28). While LÜTKENHAUS mentions in column 2, lines 34 to 35 that the described stator assembly could also be implemented as a delta connection system,

LÜTKENHAUS does not describe or suggest how to modify the aforementioned star connection stator assembly to obtain the delta connection system.

As BEST describes a stator assembly which completely differs from the stator assembly described by LÜTKENHAUS, BEST cannot make any suggestion of how to modify the arrangement of LÜTKENHAUS in order to obtain the stator assembly according to pending claim 2. More specifically, as described above BEST illustrates a stator assembly having nine windings that are interconnected using annular connecting leads to build a delta connection configuration. Thus, BEST cannot make any suggestion of how to modify the stator assembly of LÜTKENHAUS that has only six windings that are interconnected in a star connection configuration using essentially linear connector stripes. The mere fact that LÜTKENHAUS mentions that a delta connection system can be implemented and that BEST describes a delta connection system cannot be considered as sufficient motivation to the person skilled in the art to combine both teachings. Moreover, the LÜTKENHAUS disclosure is not enabling with regard to a delta connection.

Furthermore, the technologies described in LÜTKENHAUS and BEST for interconnecting the winding coils are completely different so that a delta connection system cannot readily be implemented using the interconnecting facilities of the stator assembly of LÜTKENHAUS together with the teachings of BEST. Finally, while LÜTKENHAUS attempts to provide an easy to manufacture stator assembly that can be mounted quickly, easily and automatically, the interconnecting of the winding coils in BEST is a complex and time-consuming task, as described above. The teaching of BEST thus teaches away from the teachings of LÜTKENHAUS. Accordingly, the Examiner's suggestion to combine LÜTKENHAUS and BEST can only be based on the use of impermissive hindsight.

Furthermore, according to pending claim 2 the inventive stator assembly has at least two successive winding coils that are continuously wound and electrically connected at their interface to an associated current rail without interrupting their winding wire. However, neither LÜTKENHAUS nor BEST describes continuously wound winding coils. In other words, even a hypothetical combination of LÜTKENHAUS and BEST does not teach all claim limitations of pending claim 2.

The person skilled in the art would further not combine LÜTKENHAUS and BEST with LILL. As described above, LÜTKENHAUS indicates that pre-wound winding coils that are wound on dielectric support frames can advantageously be used to allow a simple and easy mounting of the stator assembly. LILL, however, teaches away from pre-wound winding coils so that there is no suggestion or motivation in LÜTKENHAUS or LILL to combine both teachings. This also applies to BEST and LILL. Accordingly, the Examiner's suggestion to combine LÜTKENHAUS, BEST and LILL can also only be based on the use of impermissible hindsight.

Furthermore, according to pending claim 2 the inventive stator assembly has at least two successive winding coils that are continuously wound and electrically connected at their interface to an associated current rail without interrupting their winding wire (such as e.g. winding coils 51 and 52 in Fig. 4 of the present application). However, according to LILL only diametrically opposite winding coils are continuously wound (cp. Figs. 8 to 12 of LILL). Accordingly, neither LÜTKENHAUS nor BEST nor LILL describes at least two successive winding coils that are continuously wound. In other words, even a hypothetical combination of LÜTKENHAUS, BEST and LILL does not teach all claim limitations of pending claim 2.

Accordingly, pending claim 2 is clearly inventive, also with respect to a hypothetical combination of LÜTKENHAUS, BEST and LILL, and should, therefore, be considered allowable. Since claim 1, as amended, essentially incorporates former claim 2, this claim should also be considered allowable.

Since claim 1 is clearly inventive, its dependent claims 3 through 9 are also in condition for allowance.

Second independent claim 10, as amended, has similar features, so the same arguments for allowability apply to claim 10.

CONCLUSION

In view of the foregoing amendments and arguments, it is respectfully submitted that independent claims 1 and 10, and their respective dependent claims, are now clear, and patentably distinguish over LUTKENHAUS, LILL, BEST, BOSCH, and the other art of record, and thus are now in condition for allowance.

If the examiner notes any remaining informalities which could be resolved by a telephone call, he is invited to telephone Applicant's counsel.

Respectfully submitted,

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